IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

First Named Inventor	: Eric R. Lovegren	Appeal No. ---
Appln. No.:	09/667,297	
Filed :	September 22, 2000	Group Art Unit: 2857
For :	THRESHOLD SETTING FOR A RADAR LEVEL TRANSMITTER	Examiner: J. West
Docket No.:	R11.12-0701	

TRANSMITTAL OF APPEAL BRIEF
(PATENT APPLICATION - 37 C.F.R. §41.37)

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I HEREBY CERTIFY THAT THIS PAPER IS BEING SENT BY U.S. MAIL, FIRST CLASS, TO THE COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450, THIS

3 DAY OF May, 20 07

PATENT ATTORNEY

Sir:

Transmitted herewith is the Brief for Appellant in this application with respect to the Notice of Appeal filed on December 28, 2006.

FEE STATUS

[---] Small entity status under 37 C.F.R. §§ 1.9 and 1.27 is established by a verified statement.

FEE FOR FILING APPEAL BRIEF

Pursuant to 37 C.F.R. §41.20(b)(2) the fee for filing the Appeal Brief is $500.00/$250.00.

05/07/2007 TNGUYEN2 00000111 09667297
01 FC:1402 500.00 OP

The Director is authorized to charge any additional fees associated with this paper or credit any overpayment to Deposit Account No. 23-1123. A duplicate copy of this communication is enclosed.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: _____

Judson K. Champlin, Reg. No. 34,797
900 Second Avenue South, Suite 1400
Minneapolis, Minnesota 55402-3319
Phone: (612) 334-3222 Fax: (612) 334-3312

JKC:lrs

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

First Named Inventor :	Eric R. Lovegren	Appeal No. ---
Appln. No. :	09/667,297	
Filed :	September 22, 2000	Group Art Unit: 2857
For :	THRESHOLD SETTING FOR A RADAR LEVEL TRANSMITTER	Examiner: J. West
Docket No.:	R11.12-0701	

BRIEF FOR APPELLANT

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I HEREBY CERTIFY THAT THIS PAPER IS BEING SENT BY U.S. MAIL, FIRST CLASS, TO THE COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450, THIS 3 DAY OF May, 2007

PATENT ATTORNEY

Sir:

This is an appeal from an Office Action dated August 23, 2006 in which claims 17-20, 25, 31, 34, 37, 39 and 43-45 were finally rejected.

I. REAL PARTY IN INTEREST

Rosemount Inc., a corporation organized under the laws of the state of Minnesota, and having offices at 12001 Technology Drive, Eden Prairie, MN 55344, has acquired the entire right, title and interest in and to the invention, the application, and any and all patents to be obtained therefor, as set forth in the Assignment filed with the patent application and recorded on Reel 011110, frame 0271.

II. RELATED APPEALS AND INTERFERENCES

There are no known related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF THE CLAIMS

A. Total number of claims in the application.

Claims in the application are: 17-20, 25, 31, 34, 37, 39 and 43-45.

B. Status of all the claims.

i. Claims cancelled: 1-16, 21-24, 26-30, 32-33, 35-36, 38 and 40-42.

ii. Claims withdrawn but not cancelled: None

iii. Claims pending: 17-20, 25, 31, 34, 37, 39 and 43-45

iv. Claims allowed: None

v. Claims rejected: 17-20, 25, 31, 34, 37, 39 and 43-45

vi. Claims Objected to: None

C. Claims on appeal

The claims on appeal are: 17-20, 25, 31, 34, 37, 39 and 43-45

IV. STATUS OF AMENDMENTS

No amendments were filed subsequent to the Final Rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The claimed subject matter relates to a radar level transmitter (10, page 5, line 13) which is used to detect the level of materials (13,14,15, page 5, line 16) in a container (12, page 5, line 15). The device includes an antenna (22, page 10, line 16) coupled to a transceiver (32, page 10, line 8) which is configured to transmit a microwave pulse and produce a signal representing reflected wave pulses. A microprocessor system (30, page 10, line 8) is adapted to control the transceiver and process the signal. A threshold calculation module (56, page 14, line 29) is executable by the microprocessor and is adapted to:

- Receive information related to a dielectric constant of a first material (62, page 15, line 24).
- Receive information related to a dielectric constant of a second material (66, page 16, line 4).
- Calculate an estimated fiducial pulse amplitude related to a reflected wave pulse from an interface between the antenna and the first material (72, page 17, line 7).
- Calculate an estimated first pulse amplitude related to a reflected wave pulse from a first material interface between a first material and a second material (68, page 16, line 7).

- Set a fiducial threshold value based upon the estimated fiducial pulse amplitude (74, page 17, line 12), and
- Set a first threshold value based upon the estimated first pulse amplitude (70, page 16, line 19).

A level calculation module (58, page 14, line 29) is executable by the microprocessor system and is adapted to establish a level in the container of the first material interface using the signal, the first fiducial threshold value and the first threshold value (see page 12, line 12 through page 12, line 16).

VI. DESCRIPTION OF THE REFERENCES RELIED ON BY THE EXAMINER

Carsella et al. (U.S. Patent No. 6,626,038), hereinafter "Carsella", relates generally to a time domain reflectometry ("TDR") measuring instrument which uses a microprocessor that provides added functionality and capabilities. (See Abstract). More specifically, Carsella describes a time domain reflectometry measurement instrument in which a circuit is connected to a probe for generating pulses on a transmission line and receiving reflected pulses returned on the transmission line. The reflected pulses represent a characteristic of a material being measured. An automatic scale circuit is used to automatically select location and size of a region of interest corresponding to characteristics of the probe. (See col. 2, lines 1-13).

McEwan (U.S. Patent No. 5,609,059), hereinafter "McEwan" is incorporated by reference in the Carsella patent. The McEwan reference relates to a multipurpose material level sensor which is based on time domain reflectometry of very short electrical pulses. (See Abstract). Measurements are taken between a fiducial pulse and a reflected pulse, relative to a launcher plate 18 rather than to the transceiver 12, and consequently errors in drift introduced by cable 16 are reduced. (Col. 6, lines 49-53).

Reddy, III et al. (U.S. Patent No. 5,134,377), hereinafter "Reddy, III", relates to a TDR system for detecting leakage of a liquid. An electrical pulse generator is used to generate an electrical launch pulse and for transmitting the launch pulse along a cable. A trip signal is produced upon receiving a reflected launch pulse which exceeds one or more predetermined thresholds. The predetermined thresholds are determined for a cable using an auto referencing step performed by a controller. (See Abstract).

Rost (U.S. Patent No. 6,087,977), hereinafter "Rost", relates to a receiver associated with a radar system for detecting targets over a range area. The attenuation of a return signal is selectively variable such that amplitude of the return signal is attenuated to a first level at closer ranges and attenuated to a second level at farther ranges.

De Carolis (U.S. Patent No. 3,812,422), hereinafter "De Carolis", describes an apparatus for measuring the levels of fluids in the dielectric constants of such fluids. The changes of impedance along a coaxial cable connected to a pulse generator are measured and used to measure the distances between a reference point along the cable and the points where the changes of impedance occur. The device is used, "for accurately determining the interfaces level between liquid masses and the dielectric constants of said liquids." (See Abstract).

Kielb et al. (U.S. Patent No. 5,672,975), hereinafter "Kielb", describes a level transmitter for use in a process application to measure height of a product in a tank. A low power microwave source sends a microwave signal through a microwave antenna and a low power microwave receiver receives a reflected microwave signal. Measurement circuitry determines product height based upon the received, reflected signal. (See Abstract).

VII. GROUNDS OF REJECTION TO BE REVIEWED

A.) Whether claims 17-19 and 43 are unpatentable under 35 U.S.C. § 103 based upon Carsella (incorporating by reference McEwan) in view of Reddy, III.

B.) Whether claims 25, 31, 34 and 39 are unpatentable under 35 U.S.C. § 103 based upon Carsella, Reddy, III and Rost.

C.) Whether claims 20, 37 and 45 are unpatentable under 35 U.S.C. § 103 based upon Carsella, Reddy, III and De Carolis.

D.) Whether claim 44 is unpatentable under 35 U.S.C. § 103 based upon Carsella, Reddy, III and Kielb.

VIII. ARGUMENT

In the rejections of the Final Office Action dated August 23, 2006, Carsella and Reddy, III are used in the rejections of all pending claims 17-20, 25, 31, 34, 37, 39 and 43-45.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. M.P.E.P. §2143.

Under these criteria, the Final Office Action fails to establish a *prima facie* case of obviousness of claims 17-20, 25, 31, 34, 37, 39 and 43-45 based on the cited references.

A. ARGUMENT FOR CLAIM 17, 18, 19 and 43

Independent claim 17 includes:

A radar level transmitter for providing level detection of materials in a container, the transmitter comprising:

an antenna;

a transceiver coupled to the antenna and configured to transmit a microwave pulse, having a transmit pulse amplitude, using the antenna and produce a signal representing reflected wave pulses;

a microprocessor system coupled to the transceiver and adapted to control the transceiver and process the signal;

a threshold calculation module executable by the microprocessor system and adapted to receive information related a dielectric constant of a first material and a dielectric constant of a second material and calculate an estimated fiducial pulse amplitude related to a reflected wave pulse from an interface between the antenna and the first material and an estimated first pulse amplitude related to a reflected wave pulse from a first material interface between the first material and the second material, the threshold calculation module further adapted to set a fiducial threshold value based upon the estimated fiducial pulse amplitude and set a first threshold value based upon the estimated first pulse amplitude; and

a level calculation module executable by the microprocessor system and adapted to

establish a level in the container of the first material interface using the signal, the fiducial threshold value and the first threshold value.

As noted at the top of page 5 of the Final Office Action, Carsella does not include a means for setting detection thresholds.

In the paragraph at the middle of page 5 of the Final Office Action, Reddy is relied upon as showing a, "method comprising calculated estimated reflection pulses as a function of a reference amplitude of the transmitted microwave pulse and the amplitude of the reflected pulse amplitude and setting a corresponding threshold values [sic] based upon the estimated reflected pulse amplitude." However, the cited sections of Reddy (column 1, line 64 to column 2, line 2 and column 9, lines 6-20) refer to an "auto referencing step" in which a "detection threshold" is reduced repeatedly "by one step", "until a reflection is received which exceeds the threshold". (See column 9, lines 10-15). Thus, this is not an estimation of a threshold but is the direct measurement of a comparison of an adjustable threshold with a received signal. Based upon this comparison, a threshold "up one step" is stored in memory for future use. (Column 1, lines 15-20).

Thus, the cited section of Reddy III does not show calculating an estimated fiducial pulse amplitude. Instead, it simply shows comparing a received amplitude level to a threshold level which is adjusted.

Further, claim 17 states that the threshold calculation module calculates an estimated first pulse amplitude related to a reflected wave pulse from a first material interface between first and second materials. Thus, claim 17 includes calculating two estimated pulse amplitudes, an estimated fiducial pulse amplitude and an estimated first pulse amplitude. In the cited section, the Reddy reference shows no calculation of a second estimated pulse amplitude.

Paragraph 7 on page 11 of the Advisory Action of August 23, 2006, states that the "estimation" disclosed by Applicant is an "estimation" because it was calculated based upon a correction factor and/or dielectric parameters. This statement is partially correct. The specific language in claim 17 states that the threshold calculation module is adapted to calculate an estimated fiducial pulse amplitude and an estimated first pulse amplitude. The cited Reddy III

reference shows no such calculation of estimations. That reference only uses empirical measurements in order to arrive at a threshold.

Claim 18 states that the calculation of the second threshold value is a function of a transmit pulse amplitude and information received which is related to a dielectric constant of the third material. The first full paragraph of page 6 of the Final Office Action appears to address this claim. That paragraph relies on Carsella as showing information received from an operator related to the properties of the material and cites Carsella column 5, lines 30-37. Further in that paragraph of the Final Office Action, the gain in Carsella is corrected based upon properties of the material. That same paragraph then goes on to bring in the Reddy reference as showing "calculating a threshold" and states that it would therefore be obvious to have "calculated the threshold as a function of the transmit pulse amplitude in the information related to the properties of the material." However, there is no suggestion of the two references that this can be achieved. In fact, the Reddy reference specifically teaches against such a combination and is directed to the use of "auto referencing" in which direct measurements are used to establish a threshold.

Claims 19 and 43 are dependent on allowable claim 17 and should therefore also be allowable.

B. ARGUMENT FOR CLAIMS 25, 31, 34 and 39

Claim 25 was rejected in paragraph 4 of the Final Office Action based upon Carsella in view of Reddy III and further in view of Rost. Claim 25 states that the first threshold and claim 34 states that the fiducial threshold value are is further calculated as a function of at least one of an attenuation factor and a range factor. Column 1, lines 11-21 of Rost are cited. As noted in that section of Rost, the reference relates to search and surveillance type radar susceptible to undesired echoes or return signals from adverse weather conditions and surface clutter. This is not the same field as a radar level transmitter as set forth in the pending claims. Therefore, the reference should not be combined with the others. Further, Paragraph 4 of the Final Office Action goes on to cite column 2, lines 51-58 of Rost as showing a first threshold value which is calculated as a function of at least one of an attenuation factor and a range factor. However, that section of Rost simply describes varying threshold values, "in coordination with varied attenuation of the amplitude

provided by the sensitivity time control." That section of Rost does not describe calculating a threshold based upon an attenuation or a range factor.

Claim 31 contains language similar to claim 25 related to the second threshold. Similarly, claim 34 contains similar language related to the fiducial threshold value.

Claim 39 states that the first threshold value is calculated as a function of a correction factor. The cited portion of Rost does not describe a correction factor nor does it describe calculating a first threshold value based upon a function of a correction factor.

C. ARGUMENT FOR CLAIMS 20, 37 AND 45

Claims 20, 37 and 45 were rejected in the Final Office Action based upon Carsella in view of Reddy and further in view of De Carolis. De Carolis is relied upon as showing a dielectric constant calculator for determining the dielectric constant of a material. However, dependent claim 20 states that the calculated dielectric parameter is provided to the threshold calculation module for use in establishing a level of the first material interface. There is no suggestion in the references that the De Carolis reference could be combined with the others to arrive at the claimed invention. In fact, as the Reddy III reference directly measures threshold values, there would be no reason to attempt to calculate a dielectric parameter as taught by De Carolis.

Claim 37 states that the first threshold value is further a function of at least of an offset value and temperature while claim 45 states that the first threshold value is further calculated as a function of temperature. De Carolis does not show calculating dielectric constant of a function of temperature. Further, claims 37 and 45 describe a first threshold value which is a function of (or calculated as a function of) temperature. This is not shown by the De Carolis.

D. ARGUMENT FOR CLAIM 44

Claim 44 was rejected in paragraph 6 of the Final Office Action based upon Carsella in view of Reddy and further in view of Kielb. Claim 44 describes receiving the dielectric constant of a material over a process control loop. The Kielb references is cited as illustrating receiving commands from a control room over a process control loop. Kielb does not describe receiving the

dielectric constant of a material. Further, there is no suggestion to combine the two references. In fact, the Carsella reference teaches away from such a combination. Carsella describes the use of a two-wire process control loop (column 3, lines 19-22). However, despite having access to a two-wire process control loop, Carsella still describes receiving information relating to the dielectric of the media from an operator through a keypad or a switch button interface 36 (column 5, lines 30-37).

CONCLUSION

For the reasons discussed above, Applicant respectfully submits that claims 17-20, 25, 31, 34, 37, 39 and 43-45 are not suggested by the references cited. Thus, Applicant respectfully requests that the Board reverse the Final Rejection and find all pending claims allowable.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: _____

Judson K. Champlin, Reg. No. 34,797
900 Second Avenue South, Suite 1400
Minneapolis, Minnesota 55402-3319
Phone:(612) 334-3222 Fax:(612) 334-3312

JKC:lrs/rev

IX. CLAIMS APPENDIX A

1-16. (canceled)

17. (previously presented): A radar level transmitter for providing level detection of materials in a container, the transmitter comprising:

an antenna;

a transceiver coupled to the antenna and configured to transmit a microwave pulse, having a transmit pulse amplitude, using the antenna and produce a signal representing reflected wave pulses;

a microprocessor system coupled to the transceiver and adapted to control the transceiver and process the signal;

a threshold calculation module executable by the microprocessor system and adapted to receive information related a dielectric constant of a first material and a dielectric constant of a second material and calculate an estimated fiducial pulse amplitude related to a reflected wave pulse from an interface between the antenna and the first material and an estimated first pulse amplitude related to a reflected wave pulse from a first material interface between the first material and the second material, the threshold calculation module further adapted to set a fiducial threshold value based upon the estimated fiducial pulse amplitude and set a first threshold value based upon the estimated first pulse amplitude; and

a level calculation module executable by the microprocessor system and adapted to establish a level in the container of the first material interface using the signal, the fiducial threshold value and the first threshold value.

18. (previously presented): The radar level transmitter of claim 17, wherein:

the threshold calculation module is further adapted to calculate a second threshold value as a function of the transmit pulse amplitude and the information related to a

dielectric constant of a third material; and

the level calculation module is further adapted to calculate a level of a second material interface between the second material and the third material using the signal and the second threshold value.

19. (previously presented): The radar level transmitter of claim 17, including an input/output port adapted to transmit a level output that is indicative of the first material interface.

20. (previously presented): The radar level transmitter of claim 17, including a dielectric constant calculator adapted to calculate a dielectric parameter relating to one of the first and second materials as a function of the transmit pulse amplitude and a first reflected wave pulse corresponding to a portion of the microwave pulse reflected at the first material interface, and provide the dielectric parameter to the threshold calculation module for use in establishing the level of the first material interface.

21-24. (canceled)

25. (previously presented): The radar level transmitter of claim 17, wherein the first threshold value is further calculated as a function of at least one of an attenuation factor and a range factor.

26-30. (canceled)

31. (previously presented): The radar level transmitter of claim 18, wherein the second threshold is calculated as a function of at least one of an attenuation factor and a range factor.

32-33. (canceled)

34. (previously presented): The radar level transmitter of claim 17, wherein the fiducial threshold

value is further calculated as a function of at least one of an attenuation factor and a range factor.

35-36. (canceled)

37. (previously presented): The radar level transmitter of claim 17, wherein the first threshold value is further a function of at least one of an offset value and temperature.

38. (canceled)

39. (previously presented): The radar level transmitter of claim 17, wherein the first threshold value is calculated as a function of a correction factor.

40-42. (canceled)

43. (previously presented) The radar level transmitter of claim 17 wherein the dielectric constants of the materials are received from an operator.

44. (previously presented) The radar level transmitter of claim 17 wherein the dielectric constants of the materials are received over a process control loop.

45. (previously presented) The radar level transmitter of claim 17 wherein the first threshold value is further calculated as a function of a temperature.

X. EVIDENCE APPENDIX

None.

XI. RELATED PROCEEDINGS APPENDIX

None.